Policy and Market Tools to Encourage Clean Energy

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NATIONAL COUNCIL ON ELECTRICITY POLICY

United States Department of Energy
Energy Efficiency and Renewable Energy
Philadelphia Regional Office

Sustainable Development Fund

- Created by the electric utility restructuring case of PECO Energy – one of four PA funds
- $32 million for renewable energy, advanced clean energy and energy conservation / efficiency
- Managed by The Reinvestment Fund

www.trfund.com/sdf

THE REINVESTMENT FUND
Human Interest Compounded Daily

Clean Energy States Alliance

- Began in 2000 as the Clean Energy Fund Network
- Re-formed in 2003 as the Clean Energy States Alliance
- $550,000/year budget funded by 17 member funds

www.cleanenergystates.org

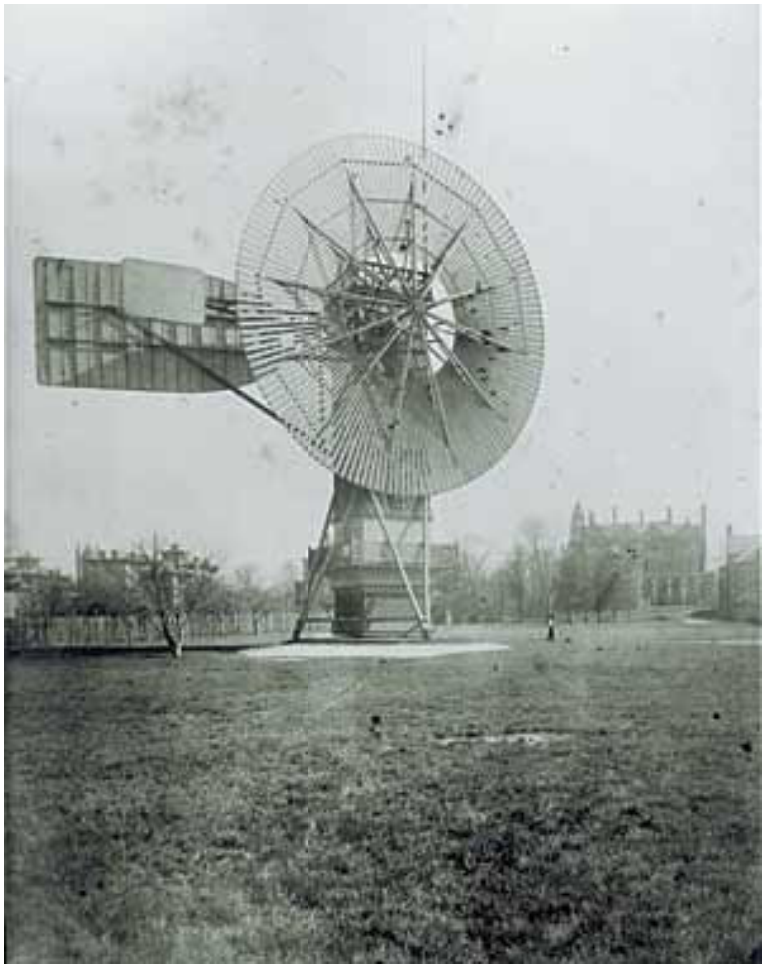
Points of Discussion

- Introduction – Disruptive Technology and Technology Deployment
- Overview of the Clean Energy Funds
- Interconnection and Net Metering

Clayton Christensen, *The Innovator's Dilemma*

"Disruptive technologies bring to a market a very different value proposition than had been available before…Because failure is intrinsic to the search for initial market applications for disruptive technologies … action must be taken before careful plans are made… [People confronting disruptive technologies must] … directly create knowledge about new customers and new applications through discovery-driven expeditions into the market place."

Clean Energy as a Disruptive Technology



The first electricity-generating wind turbine

Built in the winter of 1887-88 by Charles F. Brush in Cleveland, Ohio

50 foot diameter rotor with 144 wooden blades

Generated 12 kW and charged batteries for a DC system in house

Operated for 20 years

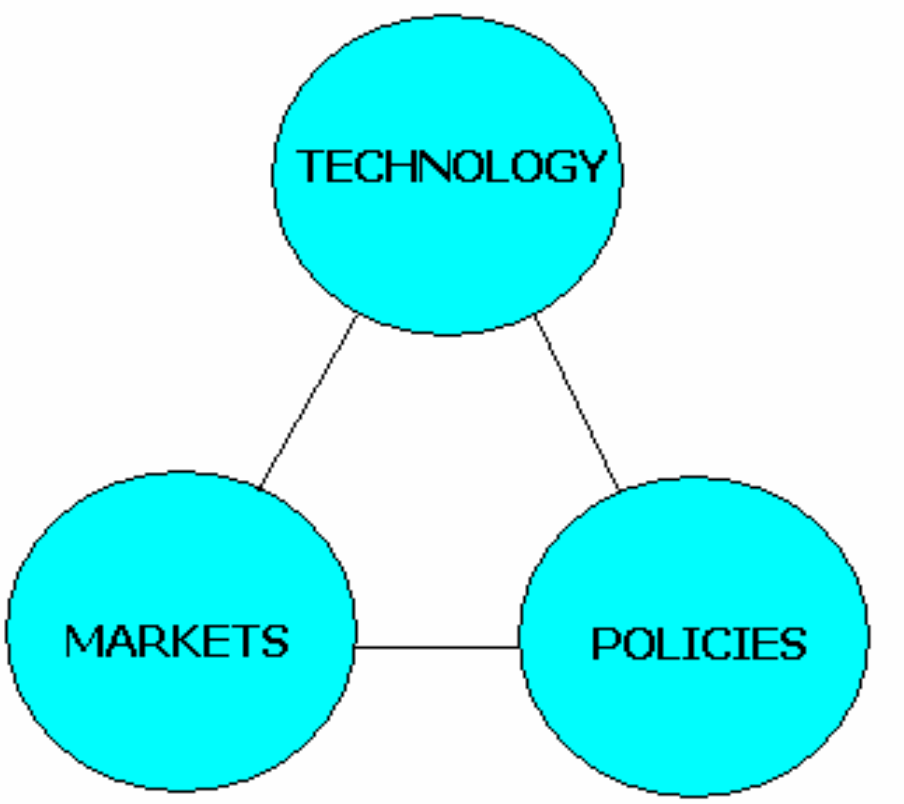
Photo © the Charles F. Brush Special Collection, Case Western Reserve University, Cleveland, Ohio.

The difficulty with disruptive technologies

"The researches of many commentators have already thrown much darkness on this subject; and it is probable that, if they continue, we shall soon know nothing about it at all."

Mark Twain

Three Legs of New Technology Deployment



Clean Energy - Technology Issues

- Costs – capital costs and operating costs
- Reliability
- Operating life
- Availability / dispatchability
- Interconnection

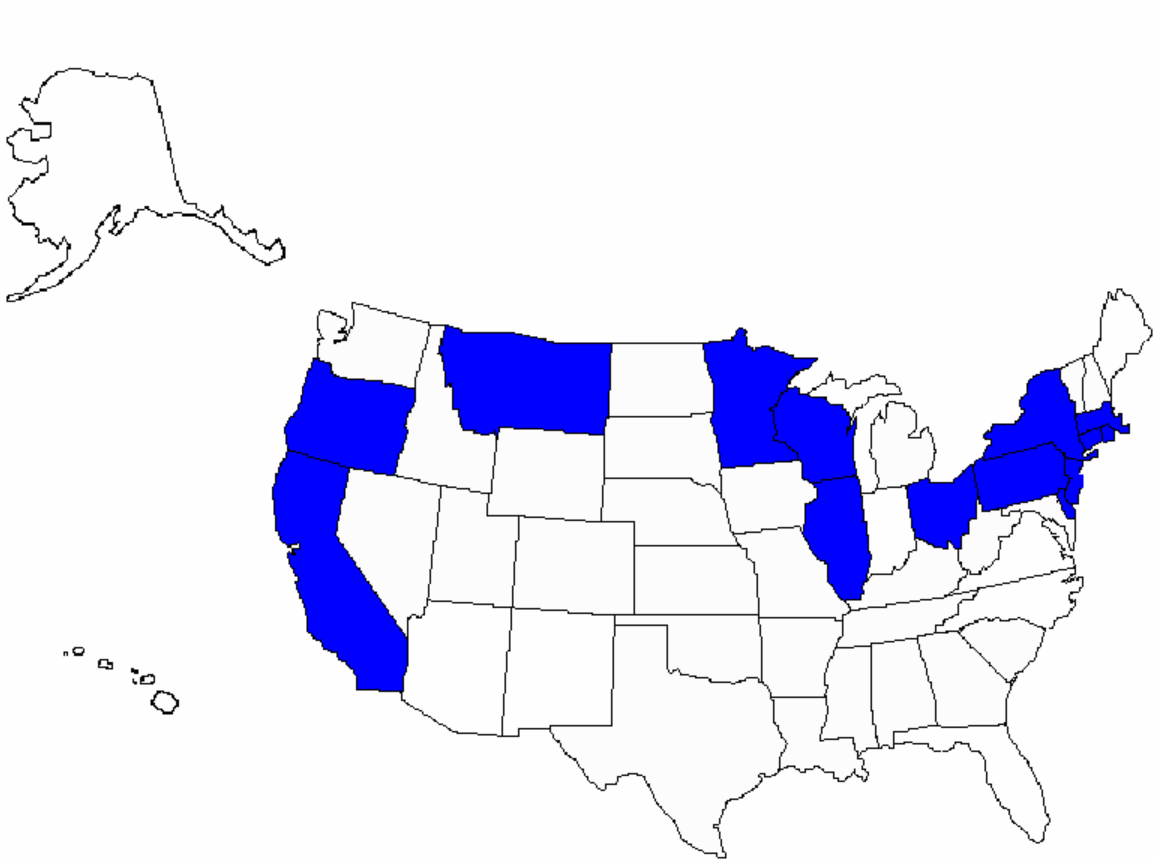
Clean Energy - Market Issues

- Educated consumers – environmental disclosure
- Installation and maintenance infrastructure
- Financing and leasing options
- Public investment / subsidies / grants
- Green power market / green blocks / green tags
- Power purchase agreements
- Government procurement / large customers
- Bulk buying groups

Clean Energy - Policy / Regulation Issues

- SBC funds
- Net Metering tariffs
- Interconnection standards
- Renewable Portfolio Standard
- Market share intervention
- Zoning, codes and standards
- Insurance
- Taxes - sales, income, property
- Renewable Energy Credits
- Valuing distribution benefits
- Real time pricing
- Environmental regulation - Clean Air Act, climate change
- Monetization of externalities
- Smart meters
- Environmental Disclosure

System or Public Benefit Charge: The Clean Energy Funds



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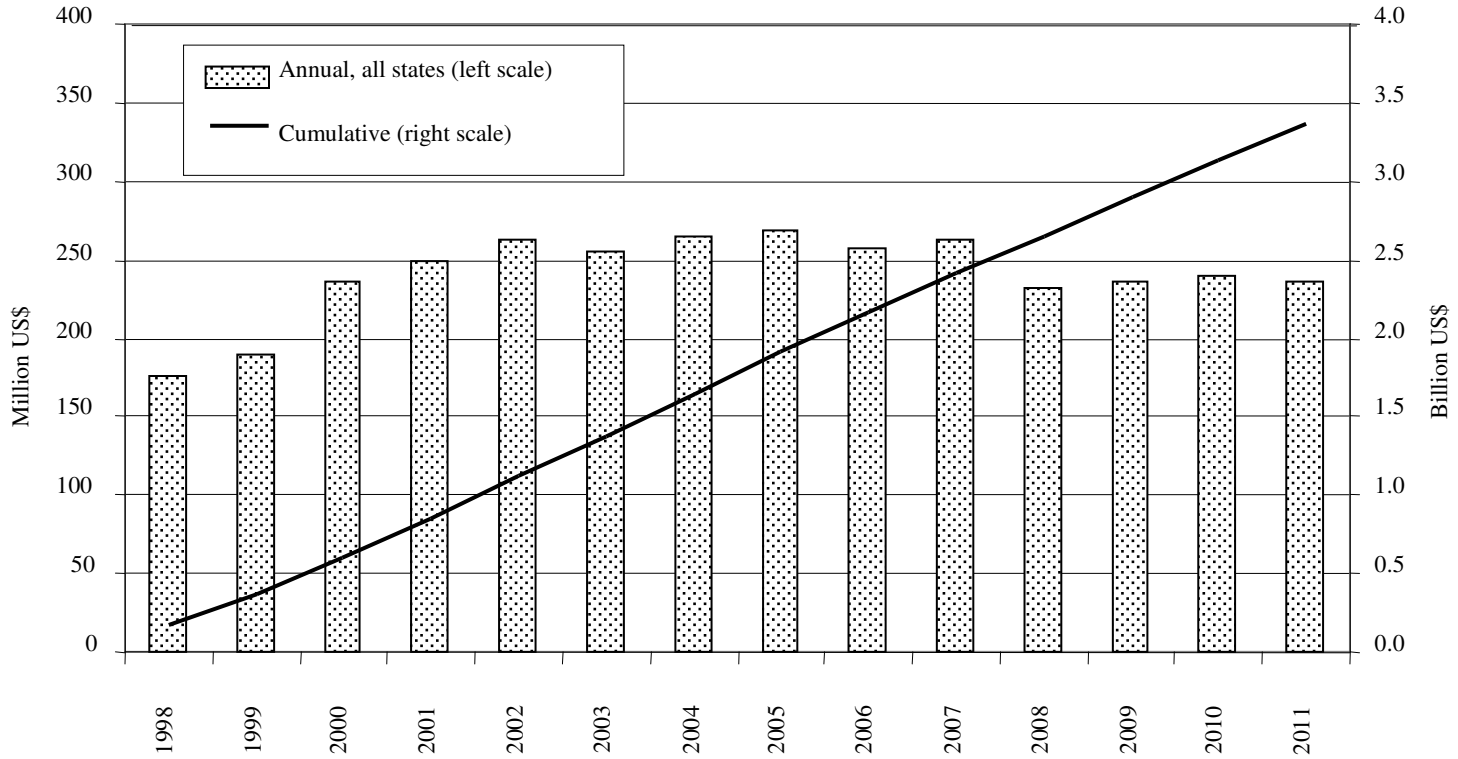
The Major Source for New Clean Energy Funding and Investment - >$3 billion



(**Source**: Mark Bolinger, Ryan Wiser, Lew Milford, Michael Stoddard, and Kevin Porter: "States Emerge as Clean Energy Investors: A Review of State Support for Renewable Energy", *Electricity Journal,* p. 84, November 2001.)

Clean Energy Funds - Annual Budgets

	Annual $ for Renewables (in million $)	Annual $ for Efficiency (in million $)
CA	$135.0	$228.0
CT	$14.0 - $28.0	$100.0
DE	$0.3 - $1.0	$1.5
IL (2 funds)	$11.3	$7.6
MA	$25.0 – $40.0	$120.0
MN	$8.0 – $9.0	--
MT	$1.8	$8.9
NJ	$31.0	$93.0
NY (2 funds)	$21.5	$107.5
OH	1.0	9.0
OR	$8.0 - $9.5	$31.5
PA (4 funds)	$9.6	$5.2
RI	$2.0 - $2.5	$14.0
WI	$3.8	$38.7

Financial Tools of the Clean Energy Funds

- Grants
- Loans
- Subordinated debt, royalty and other near-equity investment
- Equity Investment

Support for Clean Energy

- capital buy-downs
- production subsidies
- project financing
- equity investment in companies
- business development assistance
- Infrastructure support - installer training / standards
- bulk-purchases

Clean Energy Funds – Laboratories for Experimentation

- Most – but not all – came out of restructuring laws.
- State clean energy funds range in size from <$10 million to >$1.8 billion.
- Managed by state agencies, utility companies and independent, nonprofit organizations.
- Some offer mostly subsidies and grants while others are like a venture capital fund.
- Differ in the technologies they support.

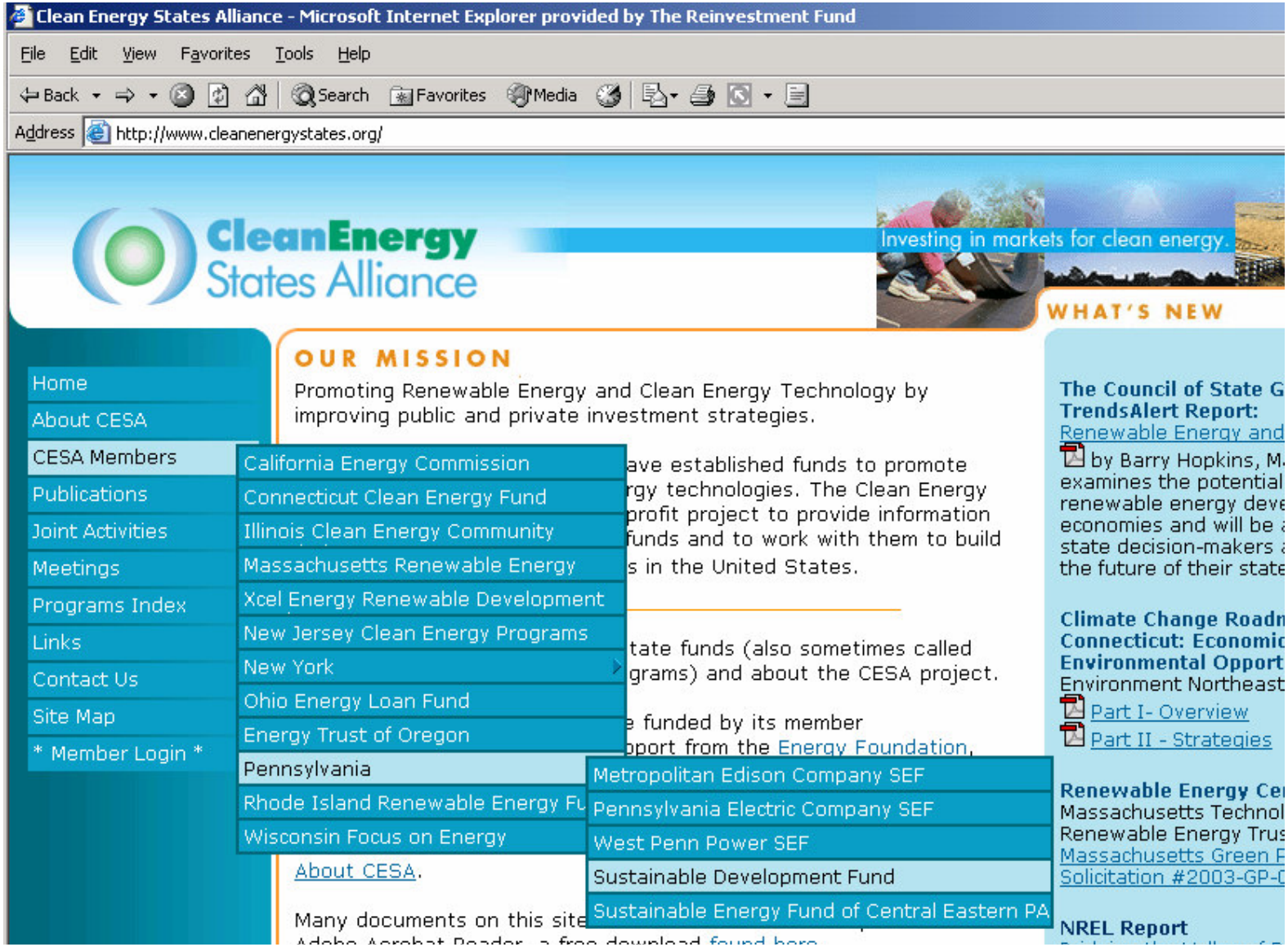
Clean Energy Funds – Initial Observations

- New and unusual entities - some early mistakes and adjustments
- Single focus on clean energy – no counterbalancing interests
- Focus on building markets at a state and regional – not federal – level
- Technological innovation in the context of the market - mission balanced by market discipline

The Mission-Market Continuum

- If all we weigh is mission, then we will not make sustained change in the market.
- But if all we consider is the market, we do not fulfill the purposes of these public funds.
- Each transaction falls at a different point on a continuum between mission and market.
- The question is has the portfolio of transactions achieved the right balance between mission and market.

Program Info – the CESA website



Interconnection and Net Metering

The fundamental design of the grid – moving large blocks of power from large centralized generating plants over long distances to demand centers – is its fundamental flaw.

The cost – economic and political - of "hardening" the grid are prohibitive.

Distributed generation as the key to a secure and resilient electric grid.

Net Metering – We've only just begun

- Eligible technologies – renewables only or other technologies as well?
- Eligible customers – residential or all customer classes?
- Eligible size - <10 kW or >1 MW?

Interconnection – We've only just begun

- Interconnection request processing time – the queue
- Interconnection study cost
- Transmission line upgrades – who pays

New Distributed Generation

Will it be renewable?

Will it be clean?